NORTH CAROLINA DIVISION OF AIR QUALITY

Application Review

Issue Date:

Region: Mooresville Regional Office
County: Gaston
NC Facility ID: 3600078
Inspector's Name: Denise Hayes
Date of Last Inspection: 05/08/2019
Compliance Code: 3 / Compliance - inspection

Facility Data

Applicant (Facility's Name): FMC Lithium USA Corp.

Facility Address:
FMC Lithium USA Corp.
1115 Bessemer City - Kings Mtn. Hwy.
Bessemer City, NC 28016

SIC: 2819 / Industrial Inorganic Chemicals
NAICS: 325188 / All Other Basic Inorganic Chemical Manufacturing

Facility Classification: Before: Title V **After:** Title V
Fee Classification: Before: Title V **After:** Title V

Permit Applicability (this application only)

SIP: 02D .0503, .0515, .0516, .0521, .0958, .1806
NSPS: NA
NESHAP: GACT ZZZZ, GACT CCCCCC
PSD: NA
PSD Avoidance: 02Q .0317 (for 02D .0531)
NC Toxics: 02D .1100; 02Q .0711
112(r): NA
Other: NA

Contact Data

Facility Contact	Authorized Contact	Technical Contact
Dave Haley Environmental & Sustainability Manager (704) 868-7630 1115 Bessemer City - Kings Mtn. Highway Bessemer City, NC 28016	Larry Spickard Plant Manager (704) 868-0833 1115 Bessemer City - Kings Mtn. Highway Bessemer City, NC 28016	Dave Haley Environmental & Sustainability Manager (704) 868-7630 1115 Bessemer City - Kings Mtn. Highway Bessemer City, NC 28016

Application Data

Application Number: 3600078.19B
Date Received: 05/31/2019
Application Type: Renewal/Modification
Application Schedule: TV-Renewal

Existing Permit Data
Existing Permit Number: 03560/T50
Existing Permit Issue Date: 01/15/2020
Existing Permit Expiration Date: 12/31/2024

Total Actual emissions in TONS/YEAR:

CY	SO2	NOX	VOC	CO	PM10	Total HAP	Largest HAP
2018	1.02	15.88	2.63	16.76	13.74	2.66	1.60 [Chlorine]
2017	0.1200	18.19	4.39	15.19	13.32	2.28	1.79 [Chlorine]
2016	0.1200	18.45	4.25	15.42	12.63	2.71	2.22 [Chlorine]
2015	0.1320	21.13	4.62	17.66	12.68	3.45	2.89 [Chlorine]
2014	0.1200	19.76	5.21	16.53	11.13	2.48	2.30 [Chlorine]

Review Engineer: Eric Crump

Review Engineer's Signature: **Date:**

Comments / Recommendations:
Issue 03560/T51
Permit Issue Date:
Permit Expiration Date:

1. Purpose of Application

FMC Lithium USA Corp (hereafter referred to as FMC Lithium) is a lithium products manufacturing facility located in Bessemer City, Gaston County, North Carolina. The facility operates under Title V Permit No. 03560T50 with an expiration date of November 30, 2019. FMC Lithium has applied for renewal of their facility's air quality permit with permit modification. The renewal application was received on May 31, 2019, or at least six months prior to the expiration date. Therefore, the existing permit shall not expire until the renewal permit has been issued or denied. All terms and conditions of the existing permit shall remain in effect until the renewal permit has been issued or denied.

Through permit application No. 3600078.19B, FMC Lithium included the following changes to the existing permit:

- Add a pre-existing lime railcar unloading operation as source ID No. **ES-LIME01**
- Remove the following sources, which no longer operate at the facility:
    - ID No. **ES-PACK01**, One dust collection system for repackaging operations including two feed bins, drumming, and bagging
    - ID No. **ES-LBLC01**, Natural gas/propane-fired lithium bromide spray dryer (4.0 million Btu per hour maximum heat input capacity) and pneumatic transport system to drumming
    - ID No. **ES-LBC02**, Lithium bromide conversion reactor
    - ID No. **ES-LHC04**, Natural gas/propane-fired lithium hypochlorite spray dryer (17 million Btu per hour maximum heat input capacity) and pneumatic transport to compaction and sizing
    - ID No. **ES-LHC05**, Lithium hypochlorite compaction and sizing operation
    - ID No. **ES-LHC07**, Lithium hypochlorite packaging operations
    - ID Nos. **ES-SIPC01** and **ES-SICP01**, Two lithium salts reactors
    - ID No. **EX-SICP03**, One nitric acid tank
    - ID No. **ES-OSW**, Various research and development and small scale production activities including one 150 gallon reactor and one batch still
    - ID No. **ES-LCL01b**, One lithium chloride conversion reactor
    - ID No. **ES-LCL02b**, One hydrochloric acid storage tank
- Remove the following sources from the list of insignificant activities:
    - ID No. **IEX-LBLC03**, One hydrogen bromide storage tank with packed bed scrubber
    - ID No. **IES-OSW03**, Organometallic Pilot Plant process area exhaust with fabric filter
- Add the following sources to the list of insignificant activities:
    - ID No. **IES-DHKILO**, Dehumidification unit at Kilo Lab (0.3 million Btu per hour)
    - ID No. **IES-DHBATT**, Dehumidification unit at Battery Metal (0.3 million Btu per hour)
    - ID No. **IES-HEATMAINT1**, Forced air heater 1 at Maintenance Facility (0.2 million Btu per hour)
    - ID No. **IES-HEATMAINT2**, Forced air heater 2 at Maintenance Facility (0.3 million Btu per hour)
    - ID No. **IES-IFHEATSHIP**, Five infrared heaters at Shipping (0.25 million Btu per hour each, 1.25 million Btu per hour total)
    - ID No. **IES-IFHEATCARBCONV**, Two infrared heaters at Carbonate Conveying (0.25 million Btu per hour each, 0.5 million Btu per hour total)
    - ID No. **IES-ROADS**, Fugitive emissions from roads

- Modify emission source descriptions for Specialty Organics production sources (ID Nos. **ES-SO01** and **ES-SO02**)

2. Facility Description

FMC Lithium manufactures lithium based organic and inorganic compounds to be used in batteries, pharmaceuticals, and other industrial applications. The facility typically operates 24 hours a day, seven days a week, and employs around 200 employees. The facility currently engages in the following operations:

- steam production (two natural gas/propane-fired utility boilers),
- lithium carbonate packaging,
- lithium hydroxide production,
- chlorine recovery,
- kilo production,
- pharmaceutical carbonate production,
- catalytic phosphate production, and
- specialty organics production.

3. Application Chronology

December 10, 2014	Division of Air Quality (DAQ) issues Permit No. 03560T46 issued to FMC Lithium as a Title V renewal and significant modification (installation of a 10th operations cell to the lithium hypochlorite production area **(ID No. ES-LHC01)**.
August 20, 2015	DAQ receives 502(b)(10) notification form for replacing silo sock filters with cartridge filter.
August 26, 2015	Mooresville Regional Office (MRO) issues Notice of Violation (NOV) to FMC Lithium for lack of records indicating an internal inspection of scrubber ID No. **CD-LCL02** was conducted in 2014 (violation of Air Permit No. 03560T46 Specific Condition and Limitation No. 2.2.A.2.d).
September 26, 2015	Compliance inspection conducted by Joseph Foutz, MRO. Facility appeared to be operating in compliance with all permit requirements.
April 21, 2016	Compliance inspection conducted by Joseph Foutz, MRO. Facility appeared to be operating in compliance with all permit requirements.
May 2, 2016	Permit No. 03560T47 issued to FMC Lithium as a minor modification (addition of a new stabilized lithium metal powder manufacturing operation**)**.
May 9, 2017	Compliance inspection conducted by Jim Hafner, MRO. Facility appeared to be operating in compliance with all permit requirements.

June 29, 2018	Permit No. 03560T48 issued to FMC Lithium for an ownership/name change from FMC Corporation – Lithium Division to FMC Lithium USA Corporation.
August 15, 2018	Compliance inspection conducted by Denise Hayes, MRO. The inspection revealed that several days of records for daily checks of the scrubber water supply (required by Permit Condition 2.1 D.1) were missing.
August 23, 2018	MRO issues NOV to FMC Lithium for failure to conduct daily checks of water supply on the scrubber (ID No. **CD-LOH01-2**) and for lack of records for those daily checks.
October 12, 2018	DAQ assesses FMC Lithium a civil penalty of $3,084.00 (North Carolina Environmental Management Commission File No. DAQ 2018-045) for failure to conduct daily checks of water supply on the scrubber (**ID No. CD-LOH01-2**) and for lack of records for those daily checks.
February 28, 2019	DAQ receives Air Permit Application No. 3600078.19A from FMC Lithium for a two-step significant modification pursuant to 15A NCAC 02Q .0501(b) to add two new production lines to include rotary dryers, product transfer and packaging equipment, raw material storage and handling equipment, fabric filters and scrubbers. Application contained a request for confidential information protection.
May 8, 2019	Compliance inspection conducted by Denise Hayes, MRO. Facility appeared to be operating in compliance with all permit requirements.
May 31, 2019	DAQ receives Air Permit Application No. 3600078.19B from FMC Lithium for Title V renewal.
July 19, 2019	DAQ informs FMC Lithium that Air Permit Application No. 3600078.19A did not state reasons why some of the information in the application should be treated as confidential and gave FMC Lithium until August 8, 2018 to provide reasons for confidential treatment in writing.
July 23, 2019	DAQ receives Notice of Intent to Construct (Tracking No. 3600078.19C) from FMC Lithium, which proposes to add two new production lines (as described in Application No. 3600078.19A).
July 30, 2019	Responding to the July 19, 2019 letter from DAQ, FMC Lithium removes the request for confidential treatment of portions of Application No. 3600078.19A.
August 2, 2019	DAQ issues approval of FMC Lithium Notice of Intent to Construct, with construction construct, beginning no sooner than August 2, 2019.
September 18, 2019	DAQ receives 502(b)(10) notification from FMC Lithium to add pneumatic conveying of material with pulsejet filter receivers to the lithium hydroxide process to recover product from conveying air.

October 17, 2019	Permit No. 03560T49 issued to FMC Lithium as step one of a two-step significant modification pursuant to 15A NCAC 02Q .0501(b) to add two new production lines. Within 12 months of start-up of any of the modified equipment, FMC Lithium is required to submit a complete Title V application.
October 17, 2019	DAQ receives Air Permit Application No. 3600078.19E from FMC Lithium for a minor modification to the permit.
January 12, 2021	DAQ receives Air Permit Application No. 3600078.21A from FMC Lithium for a minor modification to the permit.
January 15, 2020	Permit No. 03560T50 issued to FMC Lithium as a minor modification to add pneumatic conveying of material to the dust collection system for finished lithium hydroxide packaging operations (ID No. **ES-LOH02**).
August 11, 2020	Partial compliance inspection (performed via Skype due to COVID-19 restrictions) conducted by Denise Hayes, MRO. Facility appeared to be operating in compliance with all permit requirements.
January 8, 2021	Draft permit sent to FMC Lithium and Regional Office for review and comment.
January 11, 2021	Comments on draft permit received from Regional Office.
January 22, 2021	Comments on draft permit received from FMC Lithium.
xxx	Permit renewal notice published, 30-day public notice and comment period begins, and 45-day EPA comment period begins.
xxx	30-day Public notice and comment period ends.
xxx	45-day EPA comment period ends.

4. Permit Modifications and Title V Equipment Editor (TVEE) Discussion

The following table summarizes changes to the FMC Lithium permit resulting from this permit renewal:

Page No.	Section	Description of Changes
Cover and throughout	---	Updated all dates and permit revision numbers
Insignificant Activities List	Attachment	• Deleted the following sources: **ID Nos. IEX-LBLC03, IES-OSW03** • Added the following sources: **ID Nos. IES-DHBATT, IES-DHKILO, IES-HEATMAINT1, IES-HEATMAINT2, IES-IFHEATSHIP, IES-IFHEATCARBCONV, IES-ROADS, IES-ENG6**

Page No.	Section	Description of Changes
3-4	1	• Added source **ID No. ES-LIME01** • Deleted the following sources (and associated control devices): **ID Nos. ES-PACK01, ES-LCL01b, EX-LCL02b, ES-LBLC01, ES-LBLC03, ES-LHC04, ES-LHC05, ES-LHC07, ES-SIPC01, ES-SICP01, EX-SICP03, ES-OSW** • Deleted **Lithium Bromide Production** header • Deleted double-asterisk footnote for **ID No. ES-Kilo** • Deleted quadruple-asterisk footnote for **ID No. ES-LOH02a** • Changed triple-asterisk footnote for sources listed under the lithium hydroxide process to double-asterisk
8	2.1 B.2.c, d	Updated section to reflect the most current stipulations for 15A NCAC 02D .0521
8	2.1 C	• Deleted entire section C on lithium products repackaging (**ID No. ES-PACK01**) and controls). • Re-lettered former section D for lithium hydroxide rotary dryer (**ID No. ES-LOH1** and controls) as section C
9-10	2.1 C.1.f 2.1 C.2.c, e	Updated sections to reflect the most current stipulations for 15A NCAC 02D .0515 and.0521, respectively
10	2.1 D, E 2.1 E 2.1 E.1.c	Re-lettered former section E for stabilized lithium metal powder production (**ID No. ES-Kilo**) as section D Re-lettered former section F for lithium hydroxide packaging dust collection system **(ID No. ES-LOH02**) as section E Inserted the word “plate” between “impingement” and “scrubber”
11	2.1 E.1.f 2.1 E.2.c, e	Updated section to reflect the most current stipulations for 15A NCAC 02D .0515 Updated section to reflect the most current stipulations for 15A NCAC 02D .0521
11-12	2.1 F	Re-lettered former section G for lithium chloride conversion reactors (**ID No. ES-LCL01a**) as section F Deleted source **ID No. ES-LCL01b** from this section
14	2.1 F.1.f 2.1 F.2.c, e	Updated section to reflect the most current stipulations for 15A NCAC 02D .0515 Updated section to reflect the most current stipulations for 15A NCAC 02D .0521
15	2.1 G	Re-lettered former section H for natural gas/propane-fired rotary dryer **(ID No. ES-LCL03)** as section G
16	2.1 G.1.f	Updated section to reflect the most current stipulations for 15A NCAC 02D .0515

Page No.	Section	Description of Changes
17	2.1 G.3.c, e 2.1 H	Updated section to reflect the most current stipulations for 15A NCAC 02D .0521 • Deleted entire section J on natural gas/propane-fired lithium bromide spray dryer (ID No. **ES-LBLC01**) and associated controls). • Re-lettered former section K for chlorine recovery system (**ID No. ES-LHC01)** and associated controls as section H
18	2.1 H.2.c, e	Updated section to reflect the most current stipulations for 15A NCAC 02D .0521
19	2.1 I, J	• Deleted entire section L on natural gas/propane-fired lithium hypochlorite spray dryer (**ID No. ES-LHC04**) and associated controls). • Deleted entire section M on lithium hypochlorite compaction and sizing operation (**ID No. ES-LHC05**) and lithium hypochlorite packaging operations (**ID No. ES-LHC07**) and associated controls). • Re-lettered former section N for specialty organics production **(ID Nos. ES-SO01 and ES-SO02)** and associated tanks as section I • Deleted entire section O on organometallics semiworks (**ID No. ES-OSW**) and associated controls). • Re-lettered former section P for two steam-heated product rotary dryers **(ID Nos. ES-PROD01 and ES-PROD03)** and associated equipment and controls as section J
21	2.1 K 2.1 K.1	Re-lettered former section Q for two finished product transfer and packaging **(ID Nos. ES-PROD02 and ES-PROD04)** and associated controls as section K Deleted paragraphs c and d; moved discussion of sources and controls to the following paragraph (now paragraph c); redesignated paragraphs e through i to d through g
23	2.1 K.2.c	Removed mention of establishing normal for sources
24	2.1 L	Re-lettered former section R for Raw Material 2 Storage and Handling **(ID Nos. ES-RM101 and ES-RM102)** and associated controls as section L
25	2.1 L.1	Deleted paragraphs c and d; moved discussion of sources and controls to the following paragraph (now paragraph c); redesignated paragraphs e through i to d through g
26	2.1 M	Re-lettered former section S for Raw Material 1 Storage and Handling **(ID Nos. ES-RM201 and ES-RM202)** and associated controls as section M
26-27	2.1 M.1	Deleted paragraphs c and d; moved discussion of sources and controls to the following paragraph (now paragraph c); redesignated paragraphs e through i to d through g

Page No.	Section	Description of Changes
28	2.1 N	Re-lettered former section T for pneumatic conveying section of lithium hydroxide packaging operations including two pulsejet fabric filters **(ID No. ES-LOH02a)** and associated controls as section N
29	2.1 O	Added new section O for lime railcar unloading operation **(ID No ES-LIME01)**
32	2.2 A.1	• Deleted specialty inorganics **(ID Nos. ES-SIPC01 and ES-SICP01)** and organometallic semiworks **(ID No. ESW)** from table • Deleted the words "phenyl lithium production" from description of specialty organics in the Emission Source(s) column of the table • Changed "**ES-SO01-ST34**" to "**ES-SO01-ST36**" in the Emission Source(s) column of the table
	2.2 A.2.a	Deleted "**ES-SO03**"
	2.2 a.2.b	Changed "LiCl" to "lithium chloride", and deleted source **ID No. ES-LCL01b**
	2.2 A.2.c	Deleted paragraph c, and re-lettered paragraph d as paragraph c
33	2.2 A.2.e	• Deleted paragraph e, and re-lettered paragraph f as paragraph d. • Changed "observations" to "monitoring and recordkeeping activities given in Sections 2.2 A.2.b.ii and c.ii above"
	2.2.A.3	Redesignated Section 2 (15A NCAC 02D .1100: CONTROL OF TOXIC AIR POLLUTANTS)" as Section 2.2 A.3
	2.2 A.3.a	Deleted spray dryers **(ID Nos. ES-LBLC01, ES-LHC04)** from table
	2.2 A.3.c	Changed "observations" to "monitoring and recordkeeping activities given in Sections 2.2 A.2.b.ii and c.ii above"
35	2.2 D	Deleted section D, Facility-wide affected sources. Re-lettered section E as section D
	2.2 D.1	Inserted "AREAS" after "SOURCES IN NONATTAINMENT
36	2.2 D.1.d	Inserted "given in Section 2.2 D.1.c above" between the words "activities" and "postmarked"
	2.2 F	Re-lettered section F as section E
37	2.2 E.1.d	Inserted "given in Section 2.2 E.1.c above" between the words "activities" and "postmarked
	2.2 G	Re-lettered section G as section F
38-48	3	Updated General Conditions to Version 5.5 dated 08/25/2020

The following changes were made to the Title V Equipment Editor (TVEE):

Sources Added:

- ID No. **ES-LIME01**, Lime railcar unloading operation
- ID No. **IES-DHKILO**, Dehumidification unit at Kilo Lab (0.3 million Btu per hour)
- ID No. **IES-DHBATT**, Dehumidification unit at Battery Metal (0.3 million Btu per hour)
- ID No. **IES-HEATMAINT1**, Forced air heater 1 at Maintenance Facility (0.2 million Btu per hour)
- ID No. **IES-HEATMAINT2**, Forced air heater 2 at Maintenance Facility (0.3 million Btu per hour)
- ID No. **IES-IFHEATSHIP**, Five infrared heaters at Shipping (0.25 million Btu per hour each, 1.25 million Btu per hour total)
- ID No. **IES-IFHEATCARBCONV**, Two infrared heaters at Carbonate Conveying (0.25 million Btu per hour each, 0.5 million Btu per hour total)
- ID No**. IES-ENG6**, One natural gas-fired emergency generator at computer server (25 kW)
- ID No. **IES-ROADS**, Fugitive emissions from roads

Sources Deleted:

- ID No. **ES-PACK01**, One dust collection system for repackaging operations including two feed bins, drumming, and bagging
- ID No. **ES-LBLC01**, Natural gas/propane-fired lithium bromide spray dryer (4.0 million Btu per hour maximum heat input capacity) and pneumatic transport system to drumming
- ID No. **ES-LBC02**, Lithium bromide conversion reactor
- ID No. **ES-LHC04**, One natural gas/propane-fired lithium hypochlorite spray dryer (17 million Btu per hour maximum heat input capacity) and pneumatic transport to compaction and sizing
- ID No. **ES-LHC05**, Lithium hypochlorite compaction and sizing operation
- ID No. **ES-LHC07**, Lithium hypochlorite packaging operations
- ID Nos. **ES-SIPC01** and **ES-SICP01**, Two lithium salts reactors
- ID No. **EX-SICP03**, One nitric acid tank
- ID No. **ES-OSW**, Various research and development and small scale production activities including one 150 gallon reactor and one batch still
- ID No. **ES-LCL01b**, One lithium chloride conversion reactor
- ID No. **EX-LCL02b**, One hydrochloric acid storage tank
- ID No. **IEX-LBLC03**, One hydrogen bromide storage tank with packed bed scrubber (ID No. **ICD-LBLC03**)
- ID No. **IES-OSW03**, Organometallic Pilot Plant process area exhaust with fabric filter (ID No. **ICD-OMPP03**)

Revisions to Sources:

Source ID No.	Former Emission Source Description	New Source ID No.	New Emission Source Description
ES-SO01-PV01	One process vessel (e.g., process reactor, filter, and or process tank)	**ES-SO01**	Various production activities including: -30 process vessels (e.g., process reactors, filters, and/or process tanks) -36 storage tanks (Nos. **TK-100** through **TK-955**, excluding vessels in **ES-SO02**)) -railcar, truck, isotainer, cylinder loadout station (No. **RCL01**)
ES-SO02	-Four storage tanks (Nos. **ST01, ST02, ST04**, and **ST05**) -Hydrochloric acid tank (No. **ST03**) -Hot ethylene glycol storage tank (No. **ST06**)	No change	-Four storage tanks (Nos. **TK-104, TK-105, TK-110**, and **TK-682**) -Hydrochloric acid tank (No. **TK-110**) -Washout tank (No. **TK-682**) -Drum loadout station (No. **DSL01**)

5. Description of Changes and Estimated Emissions

A. Addition of an existing lime railcar unloading operation as source ID No. **ES-LIME01**. While lime is an essential ingredient in manufacturing lithium hydroxide, emissions from the unloading of lime from railcars had until now never been addressed in the permit. Lime delivered to the facility by railcar is dropped from the railcar bottom into a covered conveyor and transported to an enclosed storage silo.

Using a conservative open truck loading emission factor of 1.5 pounds per ton (lb/ton) from AP-42[1], and an annual maximum throughput of 12,264 tons per year[2] (ton/yr), uncontrolled particulate matter (PM) emissions for lime unloading at the facility are calculated using the following formula:

Uncontrolled PM (ton/yr) = Maximum Lime Throughput (ton/yr) × PM Emission Factor (lb/ton) × [Conversion Factors]

$$= 12{,}264 \text{ ton/yr} \times 1.5 \text{ lb/ton} \times [1 \text{ ton}/2000 \text{ lb}] = \mathbf{9.20 \text{ ton/yr}}$$

The allowable emission rate for lime railcar unloading is determined using one the following equations from the applicable PM regulation for this source, 15A NCAC 02D .0515: Particulates from Miscellaneous Industrial Processes:

$E = 4.10 \times P^{0.67}$ (for process rates less than or equal to 30 tons per hour), or
$E = 55.0 \times P^{0.11} - 40$ (for process rates greater than 30 tons per hour)

[1] U.S. EPA. AP-42. Compilation of Air Pollutant Emissions Factors, Section 11.17- Lime Manufacturing, Table 11.17-4. https://www.epa.gov/air-emissions-factors-and-quantification/ap-42-compilation-air-emissions-factors. The "Product Loading, open truck" factor was used.
[2] Based on current maximum lithium hydroxide (LiOH) production capacity at the facility (0.8 parts lime used to make one part LiOH).

Where: E = allowable emission rate in pounds per hour
P = process weight in tons per hour

If P for lime unloading = 12, 264 ton/yr × 1 yr/1000[3] hr = 12.3 ton/hr (a process rate less than 30 ton/hr),

then, using $E = 4.10(P)^{0.67}$, the allowable rate for lime unloading = $4.10(12.3)^{0.67}$ = **22 ton/yr**.

Therefore, the lime railcar unloading operation at FMC Lithium emits less than the allowable rate in the regulation. Compliance is expected.

B. Removal of the following sources that no longer operate at the facility:
- ID No. **ES-PACK01**, Lithium Salts Repackaging
- ID Nos. **ES-LBLC01** and **ES-LCC02**, Lithium Bromide Production
- ID Nos **ES-LHC04, ES-LHC05**, and **ES-LHC07**, Lithium Hypochlorite Production
- ID Nos. **ES-SIPC01, ES-SICP01**, and **EX-SICP03**, Specialty Inorganics
- ID No. **ES-OSW**, Organometallic Semiworks
- ID Nos. **ES-LCL01b** and **ES-LCL02b**, One lithium chloride conversion reactor and related hydrochloric acid storage tank

Removal of these sources results in a decrease in overall potential emissions at the FMC Lithium facility.

C. Removal of the following sources from the list of insignificant activities:
- ID No. **IEX-LBLC03**, One hydrogen bromide storage tank with packed bed scrubber
- ID No. **IES-OSW03**, Organometallic Pilot Plant process area exhaust with fabric filter

These sources were classified as insignificant activities under 15A NCAC 02Q .0503(8) because emissions from each of these sources did not violate any applicable emissions standard, potential uncontrolled criteria pollutant emissions from each source were less than five tons per year, and potential uncontrolled HAP emissions from each of these sources were below 1000 pounds per year. As insignificant activities, these sources had very little impact on overall emissions at the facility. Removal of these sources will result in a minimal reduction of overall emissions at the facility. Continued compliance is expected.

D. Addition of the following sources to the list of insignificant activities:
- ID No. **IES-DHKILO**, Dehumidification unit at Kilo Lab (0.3 million Btu per hour)
- ID No. **IES-DHBATT**, Dehumidification unit at Battery Metal (0.3 million Btu per hour)
- ID No. **IES-HEATMAINT1**, Forced air heater 1 at Maintenance Facility (0.2 million Btu per hour)
- ID No. **IES-HEATMAINT2**, Forced air heater 2 at Maintenance Facility (0.3 million Btu per hour)
- ID No. **IES-IFHEATSHIP**, Five infrared heaters at Shipping (0.25 million Btu per hour each, 1.25 million Btu per hour total)

[3] Conservative assumption of hours of railcar unloading per year.

- ID No. **IES-IFHEATCARBCONV**, Two infrared heaters at Carbonate Conveying (0.25 million Btu per hour each, 0.5 million Btu per hour total)
- ID No. **IES-ROADS**, Fugitive emissions from roads
- ID No**. IES-ENG6**, One natural gas-fired emergency generator at computer server (25 kW)

These sources have been classified as insignificant activities under 15A NCAC 02Q .0503(8) for the reasons explained in section C above. The seven infrared heaters are powered with electricity and generate no emissions onsite. Fugitive PM emissions from onsite materials hauling on roads were estimated[4] to be less than one-tenth of one ton per year. For this reason, these sources are not subject to any permit conditions. Continued compliance is expected.

6. Regulatory Review

No additional state regulations have become applicable to the FMC Lithium facility as a result of this permit renewal. The facility remains subject to the following state regulations:

Regulation	Title	Sources
02D .0503	Particulates from Fuel Burning Indirect Heat Exchangers	Two natural gas/propane-fired utility boilers **(ID Nos. ES-UB3 and ES-UB4)**
02D.0515	Particulates from Miscellaneous Industrial Processes	Lithium carbonate receiving **(ID No. ES-LCW02)** One steam-heated lithium hydroxide rotary dryer **(ID No. ES-LOH01)** Lithium hydroxide packaging dust collection system **(ID No. ES-LOH02)** Lithium chloride conversion reactors **(ID Nos. ES-LCL01a** One "old" natural gas/propane-fired rotary dryer **(ID No. ES-LCL03)** Lithium bromide conversion reactor **(ID No. ES-LBLC02)** Chlorine recovery system consisting of 10 lithium metal manufacturing cells **(ID No. ES-LHC01)** Two Steam-heated Product Rotary Dryers **(ID Nos. ES-PROD01 and ES-PROD03)** with fines dissolver, product screener, and material transfer filters Two Finished Product Transfer and Packaging **(ID Nos. ES-PROD02 and ES-PROD04)** Two Raw Material 1 Storage and Handling **(ID Nos. ES-RM101 and ES-RM102)** Two Raw Material 2 Storage and Handling **(ID Nos. ES-RM201 and ES-RM202)** Pneumatic conveying section of lithium hydroxide packaging operations including two pulsejet fabric filters **(ID No. ES-LOH02a)** Lime railcar unloading operation **(ID No ES-LIME01)**
02D.0516	Sulfur Dioxide Emissions from Combustion Sources	Two natural gas/propane-fired utility boilers **(ID Nos. ES-UB3 and ES-UB4)** One "old" natural gas/propane-fired rotary dryer **(ID No. ES-LCL03)**

[4] Emission factors from AP-42, Section 13.2. 1, Paved Roads were used.

Regulation	Title	Sources
02D.0521	Control of Visible Emissions	Two natural gas/propane-fired utility boilers **(ID Nos. ES-UB3 and ES-UB4)** Lithium carbonate receiving **(ID No. ES-LCW02)** One steam-heated lithium hydroxide rotary dryer **(ID No. ES-LOH01)** Lithium hydroxide packaging dust collection system **(ID No. ES-LOH02)** Lithium chloride conversion reactors **(ID Nos. ES-LCL01a** One "old" natural gas/propane-fired rotary dryer **(ID No. ES-LCL03)** Lithium bromide conversion reactor **(ID No. ES-LBLC02)** Chlorine recovery system consisting of 10 lithium metal manufacturing cells **(ID No. ES-LHC01)** Two Steam-heated Product Rotary Dryers **(ID Nos. ES-PROD01 and ES-PROD03)** with fines dissolver, product screener, and material transfer filters Two Finished Product Transfer and Packaging **(ID No. ES-PROD02 and ES-PROD04)** Two Raw Material 1 Storage and Handling **(ID Nos. ES-RM101 and ES-RM102)** Two Raw Material 2 Storage and Handling **(ID Nos. ES-RM201 and ES-RM202)** Pneumatic conveying section of lithium hydroxide packaging operations including two pulsejet fabric filters **(ID No. ES-LOH02a)** Lime railcar unloading operation **(ID No ES-LIME01)**
02D .0958	Work Practices for Sources of Volatile Organic Compounds	Stabilized Lithium Metal Powder Production **(ID No. ES-Kilo)** Specialty Organics Production **(ID Nos. ES-SO01 and ES-SO02)** including three storage tanks **(ID Nos. ES-SO02-ST04 through ES-SO02-ST06)**
02D.1100/02Q .0711	Control of Toxic Air Pollutants	Stabilized Lithium Metal Powder Production **(ID No. ES-Kilo)** One "old" natural gas/propane-fired rotary dryer **(ID No. ES-LCL03)** Specialty Organics Production **(ID Nos. ES-SO01 and ES-SO02)** including three storage tanks **(ID Nos. ES-SO02-ST04 through ES-SO02-ST06)**
02D .1806	Control and Prohibition of Odorous Emissions	Stabilized Lithium Metal Powder Production **(ID No. ES-Kilo)** Lithium chloride conversion reactors **(ID Nos. ES-LCL01a** One "old" natural gas/propane-fired rotary dryer **(ID No. ES-LCL03)** Lithium bromide conversion reactor **(ID No. ES-LBLC02)** Chlorine recovery system consisting of 10 lithium metal manufacturing cells **(ID No. ES-LHC01)** Specialty Organics Production **(ID Nos. ES-SO01 and ES-SO02)** including-three storage tanks **(ID Nos. ES-SO02-ST04 through ES-SO02-ST06)**
02Q .0317	Avoidance Conditions (for 02D .0531, Sources in Nonattainment Areas)	Specialty Organics Production **(ID Nos. ES-SO01 and ES-SO02)** including three storage tanks **(ID Nos. ES-SO02-ST04 through ES-SO02-ST06)**

The FMC Lithium facility is sited in Gaston County, which continues to be part of a maintenance area for the 1997 8-hour ozone standard. Clean Air Act provisions require volatile organic compound (VOC) requirements

previously implemented in an ozone nonattainment area prior to redesignation to remain in place. Therefore, FMC Lithium is required to comply with the work practice standards for VOCs in 15A NCAC 02D .0958.

The permit has been updated to reflect the most current stipulations for all applicable regulations. Continued compliance is expected.

7. National Emission Standards for Hazardous Air Pollutants (NESHAPS): Maximum and/or Generally Achievable Control Technology (MACT/GACT)

The following table shows the sources at FMC Lithium and the GACT standards to which they are currently subject.

Source ID No.	Source Description	GACT Standard
IES-FUELTANKS	Five fuel storage tanks (1-gasoline, 2-diesel, 1-kerosene, 1-used oil)	40 CFR 63, Subpart CCCCCC, National Emission Standards for Hazardous Air Pollutants for Source Category: Gasoline Dispensing Facilities *(applies to gasoline tank only)*
IES-ENG1	One diesel-fired emergency generator at the spare main (60 kW)	40 CFR 63, Subpart ZZZZ, National Emission Standards for Hazardous Air Pollutants for Stationary Reciprocating Internal Combustion Engines
IES-ENG2	One diesel-fired emergency generator at the metal building (75 kW)	40 CFR 63, Subpart ZZZZ
IES-ENG3	One diesel-fired emergency generator at the SO Plant (250 kW)	40 CFR 63, Subpart ZZZZ
IES-ENG4	One diesel-fired emergency generator at OSW (80 kW)	40 CFR 63, Subpart ZZZZ
IES-ENG5	One propane-fired emergency generator at the sewer lift station (20 kW)	40 CFR 63, Subpart ZZZZ
IES-ENG6	One natural gas-fired emergency generator at computer server (25 kW)	40 CFR 63, Subpart ZZZZ
IES-ENG7	One diesel-fired emergency fire pump engine at Plant 1 (150 hp)	40 CFR 63, Subpart ZZZZ
IES-ENG8	One diesel-fired emergency fire pump engine at Plant 2 (150 hp)	40 CFR 63, Subpart ZZZZ

These sources have all been classified as insignificant activities under 15A NCAC 02Q .0503(8); while they are subject to the GACT standards, they are not subject to any permit conditions. This permit renewal does not change this status. Continued compliance is expected.

8. New Source Performance Standards (NSPS)

No sources at FMC Lithium are currently subject to an NSPS. This permit renewal does not change this status. Continued compliance is expected.

9. New Source Review (NSR)/Prevention of Significant Deterioration (PSD)

The facility has not been subject to any PSD requirements. This permit renewal does not change this status. Continued compliance is expected.

10. Risk Management Plan Requirements

40 CFR Part 68 requires stationary sources storing more than threshold quantities of regulated substances to develop a risk management plan (RMP), in accordance with Section 112(r) of the Clean Air Act. The RMP lists the potential effects of a chemical accident at the facility, steps the facility is taking to prevent an accident, and emergency response procedures to be followed if an accident should occur.

FMC Lithium is not subject to Section 112(r) of the Clean Air Act requirements because it does not store any of the regulated substances in quantities above the thresholds in the Rule. This permit renewal does not affect the 112(r) status of the facility. Continued compliance is expected.

10. Compliance Assurance Monitoring (CAM)

Under 40 CFR Part 64, a facility must develop a continuous CAM plan for any pollutant specific unit meeting all of the following criteria:

- It is located at a major source required to obtain a 40 CFR Part 70 or Part 71 permit;
- It is subject to an emission limitation or standard for a regulated air pollutant, and that standard is not exempt under 40 CFR 64.2(a)(1)(b);
- It uses an active control device to comply with that emission limitation or standard; and
- It has a potential pre-control emission rate that equals or exceeds the major source threshold for criteria pollutants or HAPs.

A preceding permit review (Permit No. 03560T46, C.Yirka, 12/10/2014) identified the following sources as potentially subject to CAM because potential pre-controlled emissions exceeded major source thresholds.

Source ID No.	Description	Potential Emissions (tons/yr)
ES-PACK01	One dust collection system for repackaging operations including two feed bins, drumming, and bagging	1752.00 (PM_{10})
ES-LHC04 (with **ES-LHC05** and **ES-LHC07**)	Natural gas/propane-fired lithium hypochlorite spray dryer (17 million Btu per hour maximum heat input capacity) and pneumatic transport to compaction and sizing	788.40 (PM_{10})
ES-SO01	Various production activities including: -30 process vessels (e.g., process reactors, filters, and/or process tanks) -36 storage tanks -railcar loadout station (No. **RCL01**)	237.34 (VOC)

Since the last permit renewal, sources ID Nos. **ES-PACK01** and **ES-LHC-04** (with **ES-LHC05** and **ES-LHC07**) have been removed from the facility. As for source ID No. **ES-SO01**, it is subject to 15A NCAC 02Q

.0317, Avoidance Conditions (for 15A NCAC 02D .0531, Sources in Nonattainment Areas), which limits this source—and the facility—to less than 100 tons of VOC emissions per year in order to avoid the applicability of NSR. As stated in the preceding permit renewal review, this limit qualifies as "an emissions cap that is approved under the rules of this Subchapter and Subchapter 15A NCAC 02Q and incorporated in a permit issued under 15A NCAC 02Q .0500" per 15A NCAC 2D .0614(b)(1)(E). For this reason, CAM was not applicable to source ID No. **ES-SO01.** This permit renewal does not affect this status. As a result, CAM does not apply to any sources at the FMC Lithium facility.

11. Facility-wide Toxics Review

The FMC Lithium facility is subject to the following state-only emission limits, in accordance with 15A NCAC 02D .1100, "Control of Toxic Air Pollutants" and 15A NCAC 02Q .0711, "Emission Rates Requiring a Permit". These emission limits were established as a facility-wide worst-case single stack modeling demonstration.

Emission Source(s)	Toxic Air Pollutant	Emission Limit(s)
Specialty Organics Various production activities including 30 process vessels **(ID Nos. ES-SO01-PV01 through ES-SO01-PV30)**	Acetic acid	2.36 lbs/hr
Specialty organics **(ID Nos. ES-SO01-PV01 through ES-SO01-PV30 and ES-SO01-ST25 through ES-SO01-ST34)** including phenyl lithium production, hexane usage, and cyclohexane usage Gasoline Storage and Dispensing	Benzene	127.2 lbs/yr
Facility wide affected sources	Chlorine (CAS No. 7782-50-5)	84.7 pounds per hour 205.3 pounds per day
Facility wide affected sources	Hydrogen chloride (CAS No. 7647-01-0)	12.9 pounds per hour
Facility wide affected sources including: Boiler **(ID No. ES-UB3)** Boiler **(ID No. ES-UB4)** Rotary Dryer **(ID No. ES-LCL03)** Various Process Vessels **(ID No. ES-S001)** SLMP **(ID No. ES-Kilo)**	n-Hexane	377.1 pounds per day

To ensure compliance with these limits, FMC Lithium is required to do the following:

- The lithium chloride conversion reactor **(ID Nos. ES-LCL01a)** shall receive hydrochloric acid through submerged fill lines.
- VOC emissions from the specialty organics processes **(ID Nos. ES-SO01-PV01 through ES-SO01-PV30, ES-SO01-ST01 through ES-SO01-ST36, ES-SO03, and ES-SO01-RCL01)** shall be controlled with a natural gas-fired flare **(ID No. CD-SO01-3)**.
- Hydrogen chloride emissions from the hydrochloric acid storage tank **(ID No. EX-LCL02a)** shall be controlled with a packed bed scrubber **(ID No. CD-LCL02)**.
- Chlorine and hydrogen chloride gas emissions from the chlorine recovery system consisting of 10 lithium metal manufacturing cells **(ID No. ES-LHCO1)** shall be controlled with an eductor with packed bed adsorber **(ID Nos. CD-LHC01 and CD-LHC03** or **ID Nos. CD-LHC02 and CD-LHC04)** installed in parallel.

- All ductwork and scrubber systems for the above shall be inspected and maintained in accordance with the manufacturers recommendations. As a minimum, the ductwork and the scrubber systems (including bed packing and spray nozzles) will be inspected annually for structural integrity. In addition, the scrubber systems shall be visually checked to ensure they function properly. The performance of these inspections, the inspection results, and any maintenance performed on a system shall be recorded in a logbook.

This permit renewal does not affect this status. Continued compliance is expected.

12. Facility Emissions Review

The table in the header page of this review summarizes annual emissions for FMC Lithium after application of required emission controls for the years 2014 through 2018. Emissions data over this period show a general reduction in NO_X and VOC emissions, as well as reductions in chlorine emissions. Emissions of other pollutants have held relatively steady, with the exception of a spike in SO_2 emissions in 2018. Continued compliance with permit limits is expected.

13. Compliance Status

Since the last permit renewal, FMC Lithium has been issued two Notices of Violation (NOV) by the Mooresville Regional Office (MRO). The first NOV was issued August 26, 2015 for missing records indicating the facility conducted an internal inspection of a scrubber (**ID No. CD-LCL02**) in 2014. A second NOV was issued August 23, 2018 for failure to conduct daily checks of water supply on a scrubber (**ID No. CD-LOH01-2**) and for failure to keep records of those daily checks. The second NOV led to the October 12, 2018 assessment of a civil penalty of $3,084.00 (North Carolina Environmental Management Commission File No. DAQ 2018-045) by DAQ.

The facility was last inspected on May 8, 2019 by Denise Hayes of the Mooresville Regional Office. The company appeared to be in compliance with all applicable requirements at that time.

14. Public Notice/EPA and Affected State(s) Review

A notice of the DRAFT Title V Permit shall be made pursuant to 15A NCAC 02Q .0521. The notice will provide for a 30-day comment period, with an opportunity for a public hearing. Consistent with 15A NCAC 02Q .0525, the EPA will have a concurrent 45-day review period. Copies of the public notice shall be sent to persons on the Title V mailing list and EPA. Pursuant to 15A NCAC 02Q .0522, a copy of each permit application, each proposed permit and each final permit shall be provided to EPA. Also, pursuant to 02Q .0522, a notice of the DRAFT Title V Permit shall be provided to each affected State at or before the time notice is provided to the public under 02Q .0521 above. South Carolina is an affected state located within 50 miles of the facility, and the Mecklenburg County Department of Environmental Protection is an affected local program.

15. Other Regulatory Considerations

The following items were not required for Permit Application No. 3600078.19B:

- Professional Engineer's seal
- Zoning consistency determination
- Permit fee.

16. Recommendations

DAQ has reviewed the permit application for FMC Lithium USA Corp. located in Bessemer City, Gaston County to determine compliance with all procedures and requirements. DAQ has determined that this facility is complying or will achieve compliance, as specified in the permit, with all requirements that are applicable to the affected sources. DAQ recommends the issuance of Air Permit No. 03560T51.